

Applicant: Sumio Kawai
Application No.: 10/600,363

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A lens-interchangeable digital camera system, comprising:

a first camera body including a first image pickup element having a pixel pitch of about 7 μm and a first optical low pass filter having a thickness determined based on the pixel pitch of about 7 μm ;

an interchangeable lens removably attached to the first camera body and having a function for correcting ~~the a~~ curvature-of-field aberration on an image-forming surface of the image pickup element; and

a second camera body including a second image pickup element to which the interchangeable lens can be removably attached, having a pixel pitch different from the pixel pitch of about 7 μm and a more greater number of pixels than that of the first image pickup element, a second optical low pass filter having ~~the a~~ thickness determined in accordance with the pixel pitch of the second image pickup element and being thinner than the first optical low pass filter, and a compensating optical system for correcting a difference in optical path length caused due to the difference in thickness of the first optical low pass filter and second optical low pass filter.

2. (Original) The lens-interchangeable digital camera system according to Claim 1,

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wherein the first and second optical low pass filters are optical elements having a double refraction characteristic, and the compensating optical system does not have a double refraction characteristic.

3. (Original) The lens-interchangeable digital camera system according to Claim 2,

wherein the first and second optical low pass filters are constituted by crystal.

4. (Currently amended) The lens-interchangeable digital camera system according to Claim 1,

wherein the ~~reflective refractive~~ index of the compensating optical system is ~~close to the reflective index of the second optical low pass filter substantially equal to that of crystal.~~

5. (Original) The lens-interchangeable digital camera system according to Claim 1,

wherein the sum of the thickness of the second optical low pass filter and the thickness of the compensating optical system is substantially equal to the thickness of the first optical low pass filter.

6. (Original) A lens-interchangeable digital camera system, comprising:

a first camera body including a first image pickup element having a first pixel pitch and a first optical low pass filter having a thickness determined in accordance with the first pixel pitch of the first image pickup element;

an interchangeable lens attachable to the first camera body, having a correction function for optimizing the curvature-of-field aberration on an image-

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forming surface of the first image pickup element when the interchangeable lens is attached to the first camera body; and

a second camera body to which the interchangeable lens can be attached, including a second image pickup element having a second pixel pitch different from the first pixel pitch, a second optical low pass filter having a thickness determined in accordance with the second pixel pitch and being thinner than the first optical low pass filter, and a compensating optical system for correcting the curvature-of-field aberration on the image-forming surface of the second image pickup element caused due to the difference in thickness of the first optical low pass filter and the second optical low pass filter.

7. (Original) The lens-interchangeable digital camera system according to Claim 6,

wherein the first pixel pitch is about 7 μm .

8. (Original) The lens-interchangeable digital camera system according to Claim 6,

wherein the second pixel pitch is narrower than the first pixel pitch.

9. (Currently amended) The lens-interchangeable digital camera system according to Claim 6, the second image pickup element has more a greater number of pixels than that of the first image pickup element.

10. (Original) A lens-interchangeable digital camera system, comprising:
an interchangeable lens for which optical aberration is corrected so as to be compliant with a reference camera body; and

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a camera body to which the interchangeable lens can be attached, having an image pickup element, an optical element within a photographic optical path of the image pickup element, and a compensating optical element provided within the photographic optical path together with the optical element in order to correct aberration due to the combination of the interchangeable lens and the optical element.

11. (Original) The lens-interchangeable digital camera system according to Claim 10,

wherein the interchangeable lens is designed so as to minimize the curvature-of-field aberration in combination with the reference camera body.

12. (Currently amended) A lens-interchangeable digital camera system, comprising:

a first camera body including a first optical low pass filter;

an interchangeable lens compliant with the first camera body and set such that an optical characteristic can correct aberration due to the first optical low pass filter; and

a second camera body to which the interchangeable lens can be attached, including a second optical low pass filter thinner than the first optical low pass filter and a compensating optical system for correcting for the difference in thickness of the first optical low pass filter and the second optical low pass filter.

13. (Original) A lens-interchangeable digital camera system according to Claim 12,

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wherein the first and second optical low pass filters are optical elements having a double refraction characteristic, and the compensating optical system is an optical element having no double refraction characteristic.

14. (Original) A camera body to which an interchangeable lens for correcting aberration to fit to a reference camera body can be attached, comprising:

an image pickup element having a different pixel pitch from that of the image pickup element in the reference camera body;

an optical low pass filter provided in a photographic optical path and having a thickness in accordance with the pixel pitch of the image pickup element; and

a compensating optical system for correcting aberration due to the combination of the interchangeable lens and the optical low pass filter.

15. (Currently amended) An interchangeable lens removably attached to multiple camera bodies, the interchangeable lens comprising:

a lens side mount portion for engaging with a mount portion of the camera body; and

a photographic optical system for optimizing aberration on the image pickup surface for ~~the~~ a thickest optical low pass filter in the multiple camera bodies.

16. (Original) An interchangeable lens according to Claim 15,
wherein the curvature-of-field aberration on the image pickup surface is minimized for a camera body having the thickest optical low pass filter.

17. (Original) The interchangeable lens according to Claim 16,

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wherein the optical low pass filter has a thickness corresponding to an image pickup element having a pixel pitch of about 7 μm .

18. (Original) The interchangeable lens according to Claim 15, wherein the thickest optical low pass filter contains crystal.

19. (Currently amended) An interchangeable lens removably attached to multiple camera bodies, comprising:

a lens side mount portion for engaging with a mount portion of the camera body; and

a photographic optical system for optimizing aberration on the ~~picked up~~ an image ~~pick up surface of~~ for a camera body having the ~~a~~ thickest optical low pass filter in the multiple camera bodies.

20. (Currently amended) An interchangeable lens configured to be removably attached to multiple camera bodies, comprising:

a lens side mount portion for engaging with a each mount portion of the multiple camera body bodies; and

a photographic optical system for optimizing aberration on the image pickup surface for the a reference camera body having an optical low pass filter having a thickness corresponding to an image pickup element having a pixel pitch of about 7 μm in the multiple camera bodies.

21. (Currently amended) A given camera body to which an interchangeable lens optically designed for a reference camera body can be removably attached, comprising:

an interchangeable lens mount portion;
an image pickup element; and
a compensating optical system provided between the mount portion and the image pickup element such that ~~the an~~ optical length between the interchangeable lens mount portion and the image pickup element is equal to that of the reference camera body.

22. (Currently amended) The given camera body according to Claim 21, wherein the compensating optical system has a reflective refractive index substantially equal to ~~an optical low pass filter in the reference camera body that of crystal.~~

23. (Currently amended) The given camera body according to Claim 21, wherein the given camera body has an optical low pass filter between the interchangeable lens mount portion and an image pickup surface of the image pickup element, and the compensating optical system compensates a difference in optical path length between an optical low pass filter in the reference camera body and the optical low pass filter in the given camera body.

24. (Currently amended) The given camera body according to Claim 23, wherein the compensating optical system has substantially the same thickness as the difference in thickness between the optical low pass filter in the reference camera body and an optical low pass filter in the given camera body.

25. (Currently amended) The given camera body according to Claim 23,

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wherein the optical low pass filter in the given camera body has a thickness different from that of an optical low pass filter in the reference camera body.

26. (Currently amended) The given camera body according to Claim 25, wherein the optical low pass filter in the given camera body is thinner than an optical low pass filter in the reference camera body.

27. (Original) A reference camera body, comprising:
an interchangeable lens mount portion for attaching an interchangeable lens;
an image pickup element; and
an optical low pass filter between the interchangeable lens mount portion and an image pickup surface of the image pickup element,
wherein the reference camera body is one of multiple camera bodies to which an interchangeable lens can be attached and is a reference for the interchangeable lens, and the optical low pass filter is the thickest in optical low pass filters among the multiple camera bodies.

28. (Currently amended) A reference camera body, comprising:
an interchangeable lens mount portion for attaching an interchangeable lens;
an image pickup element; and
an optical low pass filter between the interchangeable lens mount portion and an image pickup surface of the image pickup element,
wherein the reference camera body is one of multiple camera bodies to which an interchangeable lens can be attached and is a reference for the interchangeable lens, and the an aberration on an image pickup surface of the image pickup element

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is optimized by a combination of the optical low pass filter and the interchangeable lens.

29. (Currently amended) The reference camera body according to Claim 28,

wherein ~~the~~ a thickness of the optical low pass filter is determined in accordance with the image pickup element having a pixel pitch of about 7 μm .

30. (Original) The reference camera body according to Claim 28,
wherein the optical low pass filter is crystal.

31. (Currently Amended) ~~The~~ A lens-interchangeable digital camera system, comprising:

a first camera body including a first optical element having a predetermined function;

an interchangeable lens compliant with the first camera body, having an optical characteristic designed for correcting aberration for the first camera body; and

a second camera body to which the interchangeable lens can be attached, having:

a second optical element which has the same function as that of the first optical element and which is thinner than the first optical element; and a compensating optical system for correcting optical path length due to a difference in thickness between the first optical element and the second optical element.